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University of California
College of Agriculture
Agricultural Experiment Station
Berkeley, California

SEASONAL LABOR NEEDS FOR CALIFORNIA CROPS

KINGS COUNTY

Progress Report No. 16

by

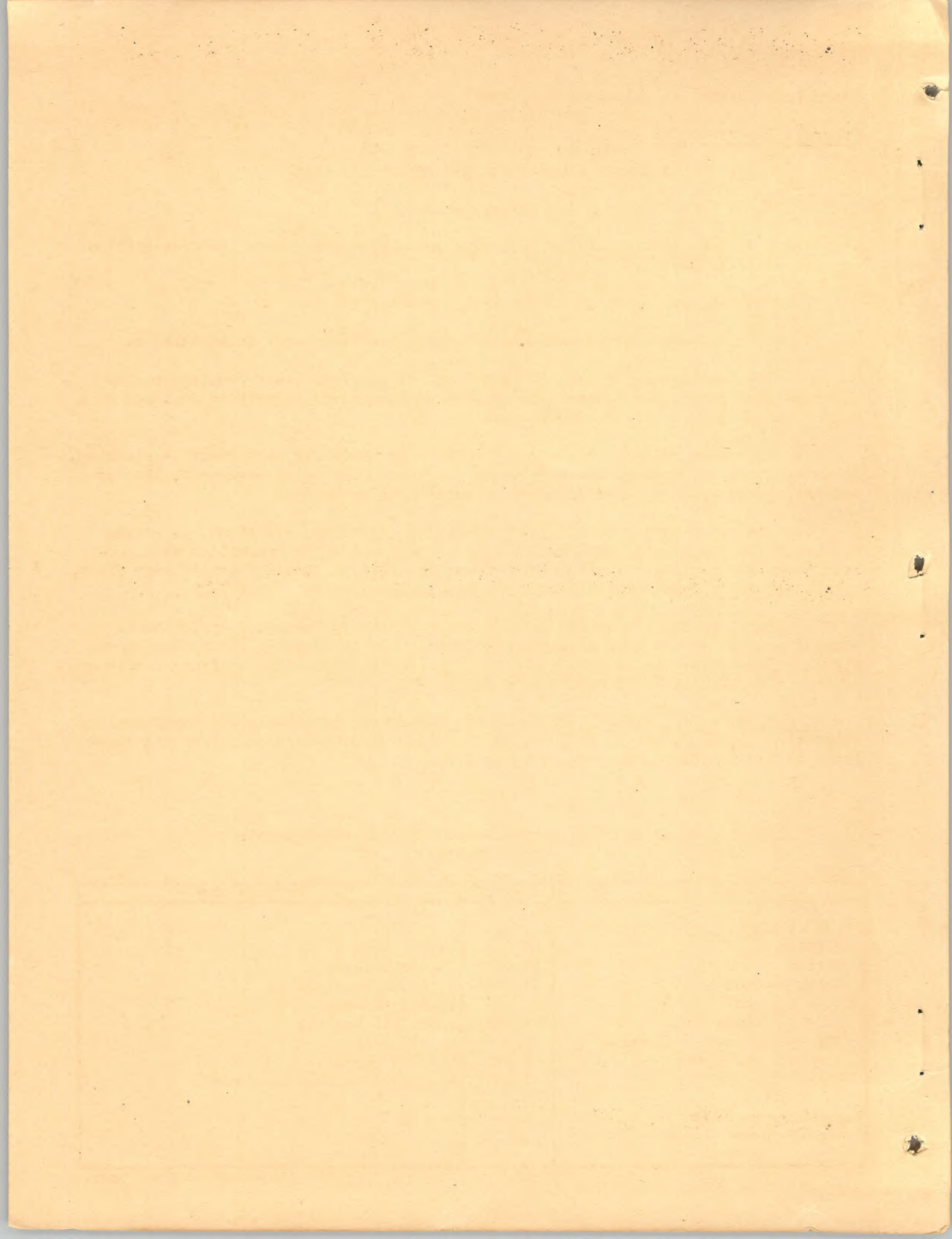
R. L. Adams

Preliminary -- Subject to Correction

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Progress Report No. 16

Seasonal Labor Needs for California Crops

Kings County

Scope of Presentation.-- The following considerations govern the presentation of this progress report:

1. The data are confined to the area indicated above.
2. The data are confined solely to crops, livestock needs being ignored.
3. The findings apply only to occasional or seasonal labor requirements as distinguished from labor contributed by farm operators and by workers employed on a year-round or regular basis of employment.
4. Attention is concentrated upon workers required for hand tasks -- planting, thinning, weeding, hoeing, and harvesting -- without including teamsters, tractor drivers, irrigators, and shed packers of vegetables or fruits.
5. The presentation includes the so-called migratory, transient, or roving workers which comprise an important source of help needed in connection with certain tasks and at "peak" times which seasonally arise in connection with many field, truck, and fruit crops commercially produced in California.
6. This report is confined to California's need for seasonal agricultural workers because of the more pressing problems liable to arise in connection therewith. A later study is planned which will deal with other kinds of labor involved in the production of California's many crops.

Crops, Acreages, and Production.-- The basis used in calculating occasional or seasonal need for labor, in addition to that furnished by farm operators and regularly employed workers, appears as table 1.

TABLE 1

Basis for Calculating Seasonal Labor Requirements
Kings County

Crops	Acreage*	Production†
Field crops:		
Alfalfa	20,100	83,337 tons
Cotton	17,700	20,479 bales ‡
Grain -- barley	22,880	1,155,529 bushels
oats	574	16,387 bushels
wheat	41,945	1,621,143 bushels
Hay -- tame and "volunteer"	8,768	11,689 tons
Sorghums for grain	5,376	112,647 bushels
Flax	2,500 §	Average 11 bushels per acre
Vegetable crops: ¶		
None reported		

Table continued on next page.

Seasonal Labor Needs for California Crops

Kings County

Scope of Presentation.-- The following considerations govern the presentation of this progress report:

1. The data are confined to the area indicated above.
 2. The data are confined solely to crops, livestock needs being ignored.
 3. The findings apply only to seasonal or occasional labor requirements as distinguished from labor contributed by farm operators and by workers employed on a year-round or regular basis of employment.
 4. Attention is concentrated upon workers required for such tasks as planting, thinning, weeding, hoeing, and harvesting -- without including harvesters, tractors, drivers, tractors, and other packers of vegetables or fruits.
 5. The presentation includes the so-called migratory, transient, or moving workers with respect to an important source of help needed in connection with certain tasks and as "peak" times which seasonally arise in connection with many field, truck, and fruit crops commercially produced in California.
 6. This report is confined to California's need for seasonal agricultural workers because of the more pressing problems liable to arise in connection therewith. A later study is planned which will deal with other kinds of labor involved in the production of California's many crops.
- Grape, Apricot, and Production.-- The basis used in calculating seasonal or occasional need for labor, in addition to that furnished by farm operators and regular employed workers, appears as Table I.

TABLE I

Basis for Calculating Seasonal Labor Requirements
Kings County

Crops	Apricot	Production †
Field crops:		
Alfalfa	30,100	88,387 tons
Cotton	17,700	20,478 bales †
Grain -- barley	32,880	1,155,629 bushels
oats	574	19,287 bushels
wheat	41,945	1,521,143 bushels
Hay -- tame and "volunteer"	3,735	11,689 tons
Sorghum for grain	5,375	112,647 bushels
Rice	2,600	Average 11 bushels per acre
Vegetable crops:		
None reported		

Table continued on next page.

Table 1 continued.

Crops	Acreage*	Production †
Fruit and nut crops:		
Apricots	3,611	14,400 tons dried (fresh weight) = 2,400 tons dry #
Grapes -- Thompson	2,295	3,655 tons sold fresh
Muscat	9,660	4,000 tons raisins (dry weight)
miscellaneous	1,126	50,000 tons for juice
Olives	272	12,500 tons shipped
Peaches -- clingstone	382	490 tons for canning)
freestone	2,875	53 tons not for canning) 543 tons total**
Plums	146	1,910 tons
Prunes	457	3,000 tons (dry weight) dried #
Walnuts	406	1,000 tons sold fresh
		438 tons (all shipped)
		650 tons ¶ (dry weight) #
		171,100 pounds merchantable
		35,100 pounds culls estimated ††

* Acreage data is from L. O. Haupt, Agricultural Commissioner, Kings County.

† Due to lack of assembled data, production figures are estimates compiled from various sources.

‡ Data from California Cooperative Crop Reporting Service -- Final California Cotton Report for the 1935 Crop -- Sacramento, May 26, 1936, 1p.

§ Considerably more flax was planted but was not harvested due to weeds, etc. Probably 3,000 acres in 1936.

¶ Prune crop unusually heavy in 1935 -- normally about 500 tons.

Drying ratios used in this report are:

Apricots -- 5 1/2 to 1
Peaches -- 5 1/2 to 1
Raisins -- 4 to 1
Prunes -- 3 1/2 to 1

** Olive production is an estimate by California Olive Association for 1935 Crop.

†† Data from Walnut Control Board. Culls estimated to be 17 per cent of total crop (state average).

Operations Requiring Seasonal Labor and Times of Need. -- Farm operations requiring the use of seasonal or occasional labor for the various crops raised in Kings County are indicated in table 2. This tabulation does not include the employing of shed workers needed to wash, pack, and prepare various commodities for shipping and marketing.

Table 1 continued

Production	Value	Notes
14,400 tons dried (fresh weight) = 2,500 tons dry	2,811	Fruit and nut crops:
3,025 tons sold fresh		Apples
4,000 tons raisins (dry weight)	2,235	Grapes -- Thompson
50,000 tons for sale	9,880	Miscellaneous
12,800 tons shipped	1,120	Olives
480 tons for canning	272	Potatoes -- all-purpose
82 tons not for canning		Potatoes
1,910 tons	282	
3,000 tons (dry weight) dried	2,875	
1,000 tons sold fresh		
488 tons (all sold)	140	
880 tons (dry weight)	227	
17,100 pounds miscellaneous	408	
28,100 pounds olive estimated		

* Average data is from L. O. Hager, Agricultural Commissioner, Fresno County.

+ Due to lack of assembled data, production figures are estimated compiled from various sources.

† Data from California Cooperative Crop Reporting Service -- Final California Cotton Report for the 1935 Crop -- Sacramento, May 28, 1936, p. 1.

‡ Considerably more flax was planted but was not harvested due to winds, etc. Probably 2,000 acres in 1936.

§ Flax crop unusually heavy in 1936 -- normally about 800 tons.

|| Dryland ratios used in this report are:

Apples -- 5 1/2 to 1
 Potatoes -- 3 1/2 to 1
 Raisins -- 4 to 1
 Grapes -- 3 1/2 to 1

** Olive production is an estimate by California Olive Association for 1935.

†† Data from Walnut Control Board. Oils estimated to be 17 per cent of kernel crop (state average).

Operations Reporting Seasonal Labor and Time of Month -- Farm operations require the use of seasonal or occasional labor for the various crops raised in Fresno County are indicated in Table 2. This tabulation does not include the employment of shed workers needed to wash, pack, and prepare various commodities for shipping and marketing.

TABLE 2

Operations Requiring Use of Seasonal Labor and Times of Needs by Crops
Kings County

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Field crops:				
Alfalfa* (50 per cent of acreage)	Mowing and raking (5 cuttings)	April -- 30 per cent of acreage May -- 90 per cent of acreage June -- 90 per cent of acreage July -- 90 per cent of acreage August -- two-thirds of acreage September -- two-thirds of acreage October -- two-thirds of acreage	50	8 acres mowing 16 acres raking
Based on 50 per cent of total crop	Shocking by hand	Same as above	50	5 acres
	Stacking -- 80 per cent of crop	May -- 20 per cent of job June -- 20 per cent of job July -- 20 per cent of job August -- 13 per cent of job September -- 13 per cent of job October -- 13 per cent of job	66	4 tons
	Baling -- 20 per cent of crop	Same as stacking	75	5 tons
	Chopping	April 15-30 -- one-sixth of acreage May 1-31 -- two-thirds of acreage June 1-15 -- one-sixth of acreage	100	2.5 acres
Cotton	Irrigating (4 times)	June 1-30 -- four-thirds of acreage July 1-31 -- four-thirds of acreage August 1-31 -- four-thirds of acreage	50	5 acres (in 12 hours)
		September 15-30 -- 2 per cent of crop	100	250 pounds
		October 1-31 -- 46 per cent of crop		
		November 1-30 -- 29 per cent of crop		
	Picking †	December 1-31 -- 11 per cent of crop		
		January 1-31 -- 9 per cent of crop	100	200 pounds
		February 1-28 -- 3 per cent of crop		

Table continued on next page.

Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Flax	Harvesting by "combine"	June 1-30 -- 40 per cent of crop July 1-31 -- 40 per cent of crop August 1-15 -- 20 per cent of crop	50	5 acres
Grain	Harvesting by "combine"	May 25-31 -- 10 per cent of acreage June 1-30 -- 40 per cent of acreage July 1-31 -- 40 per cent of acreage August 1-15 -- 10 per cent of acreage	50	7 acres (12 hours)
Sorghums (for grain)	Hauling	Same as harvesting	50	300 sacks
	Hoeing (on 500 acres)	May -- one-third of job June -- one-third of job July -- one-third of job	100	2.5 acres
	Cutting by hand, 10 per cent	September 20-30 -- 10 per cent of job October 1-31 -- 50 per cent of job November 1-30 -- 40 per cent of job	100	0.75 acre
	Harvesting (by combine) 90 per cent	October 1-31 -- 50 per cent of job November 1-30 -- 50 per cent of job	50	5 acres
	Threshing by stationary machine -- 10 per cent	October 1-31 -- 50 per cent of job November 1-30 -- 50 per cent of job	50	30 sacks (of 130 pounds)
	Pruning	November -- 10 per cent of acreage December -- 30 per cent of acreage January -- 30 per cent of acreage February -- 30 per cent of acreage	50	0.25 acre
		Brush burning	25	2 acres
		Spraying -- inconsequential		
		Thinning by hand -- 40 per cent of acreage	90	0.2 acre (15 trees)
	Thinning by poles -- 40 per cent of acreage	April 15-30 -- 50 per cent of job May 1-15 -- 50 per cent of job	50	0.5 acre
		April 15-30 -- 50 per cent of job May 1-15 -- 50 per cent of job		
Fruit and nut crops: Apricots	Pruning	November -- 10 per cent of acreage December -- 30 per cent of acreage January -- 30 per cent of acreage February -- 30 per cent of acreage	50	0.25 acre
	Brush burning	Same as pruning	25	2 acres
	Spraying -- inconsequential			
	Thinning by hand -- 40 per cent of acreage	April 15-30 -- 50 per cent of job May 1-15 -- 50 per cent of job	90	0.2 acre (15 trees)
	Thinning by poles -- 40 per cent of acreage	April 15-30 -- 50 per cent of job May 1-15 -- 50 per cent of job	50	0.5 acre

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Table 2. continued.

Crop	Operation	Time of need	Work done by seasonal help	Cost of output per man-day
Flax	Harvesting by "combine"	June 1-30 -- 40 per cent of crop July 1-31 -- 40 per cent of crop August 1-15 -- 20 per cent of crop	80	6 acres
Grain	Harvesting by "combine"	May 25-31 -- 10 per cent of average June 1-30 -- 40 per cent of average July 1-31 -- 40 per cent of average August 1-15 -- 10 per cent of average	80	7 acres (15 hours)
Sorghum (for grain)	Hauling	Same as harvesting	80	300 acres
	Hoing (on 500 acres)	May -- one-third of job June -- one-third of job July -- one-third of job	100	2.5 acres
	Cutting by hand, 10 per cent	September 20-30 -- 10 per cent of job	100	0.75 acre
	Harvesting (by combine) 80 per cent	October 1-31 -- 50 per cent of job November 1-30 -- 40 per cent of job October 1-31 -- 80 per cent of job November 1-30 -- 50 per cent of job	80	5 acres
Wheat and barley	Threshing by stationary ma- chine -- 10 per cent	October 1-31 -- 50 per cent of job November 1-30 -- 50 per cent of job	80	50 acres (of 150 acres)
	Threshing	November -- 10 per cent of average December -- 30 per cent of average January -- 30 per cent of average February -- 30 per cent of average	80	0.75 acre
5 acres	Same as haying		80	
0.5 acres (15 acres)	Straw burning Graying -- 100 per cent Threshing by hand April 15-30 -- 50 per cent of job May 1-15 -- 50 per cent of job April 15-30 -- 80 per cent of job May 1-15 -- 80 per cent of cost of average job		80	0.5 acre

Table continued on next page.

Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Apricots (cont.)	Picking for fresh use	May 20-31 -- 25 per cent of job	100	1,200 pounds
		June 1-30 -- 75 per cent of job		
	Picking for drying (15 per cent by hand, 85 per cent by shaking off)	June 7-30 -- 80 per cent of job	100	1,800 pounds by shaking off; 1,200 pounds by hand
		July 1-4 -- 20 per cent of job		
	Cutting for drying	June 7-30 -- 80 per cent of job	90	750 pounds
		July 1-4 -- 20 per cent of job		
	Other dry-yard work	June 7-30 -- 75 per cent of job	90	11 man-hours per fresh ton†
		July 1-10 -- 25 per cent of job		
	Grapes Fruiting Thompsons	December 15-31 -- 10 per cent of acreage	75	0.5 acre
		January 1-31 -- 40 per cent of acreage		
		February 1-28 -- 40 per cent of acreage		
		March 1-15 -- 10 per cent of acreage		
	Pruning other varieties	December 15-31 -- 10 per cent of acreage	75	0.66 acre
		January 1-31 -- 40 per cent of acreage		
		February 1-28 -- 40 per cent of acreage		
		March 1-15 -- 10 per cent of acreage		
	Tying (Thompson Seedless)	January 1-31 -- 40 per cent of acreage	50	1.5 acres
		February 1-28 -- 40 per cent of acreage		
		March 1-15 -- 20 per cent of acreage		
	Picking for raisins (Thompsons)	August 1-31 -- all of job	100	3,000 pounds -- about 150 trays
	Picking for shipping (field packing)	September 1-30 -- 12 per cent of job	100	30 boxes of 28 pounds
		October 1-31 -- 76 per cent of job		
		November 1-30 -- 12 per cent of job		

Table continued on next page.

No.	Date	Description	Amount	Total
1	1890	Jan 1 Balance	100.00	100.00
2	1890	Jan 10 Cash	50.00	150.00
3	1890	Jan 20 Cash	25.00	175.00
4	1890	Jan 30 Cash	75.00	250.00
5	1890	Feb 10 Cash	100.00	350.00
6	1890	Feb 20 Cash	50.00	400.00
7	1890	Feb 30 Cash	150.00	550.00
8	1890	Mar 10 Cash	200.00	750.00
9	1890	Mar 20 Cash	100.00	850.00
10	1890	Mar 30 Cash	300.00	1150.00
11	1890	Apr 10 Cash	150.00	1300.00
12	1890	Apr 20 Cash	50.00	1350.00
13	1890	Apr 30 Cash	200.00	1550.00
14	1890	May 10 Cash	100.00	1650.00
15	1890	May 20 Cash	50.00	1700.00
16	1890	May 30 Cash	150.00	1850.00
17	1890	Jun 10 Cash	200.00	2050.00
18	1890	Jun 20 Cash	100.00	2150.00
19	1890	Jun 30 Cash	300.00	2450.00
20	1890	Jul 10 Cash	150.00	2600.00
21	1890	Jul 20 Cash	50.00	2650.00
22	1890	Jul 30 Cash	200.00	2850.00
23	1890	Aug 10 Cash	100.00	2950.00
24	1890	Aug 20 Cash	50.00	3000.00
25	1890	Aug 30 Cash	150.00	3150.00
26	1890	Sep 10 Cash	200.00	3350.00
27	1890	Sep 20 Cash	100.00	3450.00
28	1890	Sep 30 Cash	300.00	3750.00
29	1890	Oct 10 Cash	150.00	3900.00
30	1890	Oct 20 Cash	50.00	3950.00
31	1890	Oct 30 Cash	200.00	4150.00
32	1890	Nov 10 Cash	100.00	4250.00
33	1890	Nov 20 Cash	50.00	4300.00
34	1890	Nov 30 Cash	150.00	4450.00
35	1890	Dec 10 Cash	200.00	4650.00
36	1890	Dec 20 Cash	100.00	4750.00
37	1890	Dec 30 Cash	300.00	5050.00
38	1890	Total		5050.00

Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Grapes (cont.)	Picking (for winery)	September 15-30 -- 15 per cent of job	100	1½ tons
		October 1-31 -- 75 per cent of job		
		November 1-15 -- 10 per cent of job		
	Turning trays	September 5-30 -- 75 per cent of job	90	1,500 trays
		October 1-10 -- 25 per cent of job		
	Rolling paper trays (50 per cent of crop)	September 15-30 -- one-third of job	75	1,500 trays
		October 1-31 -- two-thirds of job		
	Stacking wood trays (50 per cent of crop)	September 15-30 -- one-third of job	75	1,000 trays
		October 1-31 -- two-thirds of job		
	Boxing and hauling in	September 15-30 -- one-third of job	50	5,000 pounds (dry weight)
		October 1-31 -- two-thirds of job		
Olives	Picking for pickling	September 15-30 -- 15 per cent of job	100	400 pounds
		October 1-31 -- 60 per cent of job		
		November 1-21 -- 25 per cent of job		
	Picking for oil	December -- 25 per cent of job	100	500 pounds
		January -- 50 per cent of job		
		February -- 25 per cent of job		
Peaches	Pruning	December 1-31 -- one-third of acreage	50	0.25 acre
		January 1-31 -- one-third of acreage		
		February 1-28 -- one-third of acreage		
	Brush burning	Same as pruning	25	2 acres
	Thinning	May 1-31 -- all acreage	90	0.2 acre
	Picking for shipping and canning	July 15-31 -- 10 per cent of crop	90	1 ton
		August 1-31 -- 90 per cent of crop		
	Picking for drying	July 15-31 -- 10 per cent of crop	90	2,500 pounds
		August 1-31 -- 90 per cent of crop		

Table continued on next page.

Date	Description	Amount	Total
1890	Jan 1 Balance	100.00	100.00
1891	Feb 10 To Cash	50.00	150.00
1892	Mar 15 By Cash	25.00	175.00
1893	Apr 20 To Cash	75.00	250.00
1894	May 10 By Cash	30.00	280.00
1895	Jun 15 To Cash	100.00	380.00
1896	Jul 20 By Cash	40.00	420.00
1897	Aug 10 To Cash	60.00	480.00
1898	Sep 15 By Cash	20.00	500.00
1899	Oct 20 To Cash	80.00	580.00
1900	Nov 10 By Cash	35.00	615.00
1901	Dec 15 To Cash	115.00	730.00
1902	Jan 20 By Cash	50.00	780.00
1903	Feb 10 To Cash	90.00	870.00
1904	Mar 15 By Cash	45.00	915.00
1905	Apr 20 To Cash	120.00	1035.00
1906	May 10 By Cash	60.00	1095.00
1907	Jun 15 To Cash	130.00	1225.00
1908	Jul 20 By Cash	70.00	1295.00
1909	Aug 10 To Cash	140.00	1435.00

Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Peaches (cont.)	Cutting for drying	July 15-31 -- 10 per cent of job August 1-31 -- 90 per cent of job	90	1 ton (= 40 boxes)
	Other labor in dry yards	August 1-31 -- 90 per cent of job September 1-10 -- 10 per cent of job		
Plums	Pruning	November -- 10 per cent of acreage December -- 30 per cent of acreage January -- 30 per cent of acreage February -- 30 per cent of acreage	75	0.4 acre
		Thinning (25 per cent of acreage)		
		April 15-30 -- 50 per cent of job May 1-15 -- 50 per cent of job		
		June 20-30 -- 5 per cent of crop July 1-20 -- 95 per cent of crop		
	Picking	September 1-30 -- all of crop	90	800 pounds
	Pruning	November 15-30 -- 10 per cent of job December 1-31 -- 30 per cent of job January 1-31 -- 30 per cent of job February 1-28 -- 30 per cent of job	75	0.5 acre
Prunes	Picking up	September 1-30 -- all of crop	90	1,500 pounds
	Dipping and drying	September 1-30 -- 75 per cent of job October 1-15 -- 25 per cent of job	75	8.3 man-hours per fresh ton†
		October 1-31 -- all of crop	50	200 pounds
Walnuts	Shaking off, picking up, and hulling by hand	October 1-31 -- all of crop	50	200 pounds

* It is estimated that about 50 per cent of alfalfa acreage is in small holdings on which operators do all work or exchange work with neighbors, requiring no seasonal help.

† Cotton picking by months based on "Cotton Production in the United States -- crop of 1935", U.S. Department of Commerce, Bureau of the Census.

‡ From Christie, A. W. and L. C. Barnard. The principles and practice of sun-drying fruit. California Agr. Exp. Sta. Bul. 388:40-60. 1925.

Date	Description	Particulars	Amount	Balance
1890	Jan 1	Balance forward		
	Feb 1	Received from Mr. A. B.	100.00	
	Mar 1	Received from Mr. C. D.	50.00	
	Apr 1	Received from Mr. E. F.	25.00	
	May 1	Received from Mr. G. H.	75.00	
	Jun 1	Received from Mr. I. J.	125.00	
	Jul 1	Received from Mr. K. L.	175.00	
	Aug 1	Received from Mr. M. N.	225.00	
	Sep 1	Received from Mr. O. P.	275.00	
	Oct 1	Received from Mr. Q. R.	325.00	
	Nov 1	Received from Mr. S. T.	375.00	
	Dec 1	Received from Mr. U. V.	425.00	
	Total		2000.00	

The above is a true and correct copy of the original
 as shown to me by the person who presented it for
 audit and certification.
 Witness my hand and seal this 1st day of January 1891.
 Auditor

Findings of Seasonal Labor Needs.--- Details and summaries of seasonal labor requirements of Kings County agriculture are presented as table 3. The "size of task" are figures drawn from table 1, in terms of either acreage or output in tons, crates, boxes, or whatever unit is commonly used. The "output per man-day" is an average figure for the entire acreage or output figured in crates, hampers, boxes, or other units as indicated in the table. If the work is of a nature that requires a crew -- different members of which perform different tasks -- then the average shown is per man based on the entire crew. Length of day is 9 hours, November to February; 10 hours, March to October; unless otherwise stated. Wide variations in output occur between farm and farm, field and field, and season and season, because of differences in soil types, climatic conditions, weeds, yields, and other factors influencing the amount of work that a laborer can perform in a given day. Moreover, the basis of output is a mature, experienced male worker without reference to use of women, children, and more or less inexperienced help that is sometimes used in connection with certain of the tasks requiring use of seasonal workers. The column headed "available days" reflects (a) limitations set from the period within which the work must be performed because of the nature of the task, such as transplanting, thinning, weeding, and cutting, and (b) available days as determined by weather conditions, inclement weather reducing the number of days when a required task can be performed. The "required number of individuals" is given in terms of workers as noted above in connection with "output per man-day."

It is probable that the estimated number of workers required, as recorded in table 3, will often be too low, for the reason that "peaks" frequently occur, during which an unusually large proportion of the job is done in a very short period. This would naturally require a much greater number of workers than when the work is spread over a longer period, even though the total amount of labor (in man-days) remains the same.

The first part of the report deals with the general situation of the country. It is a very interesting and informative study of the country's development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's development.

The second part of the report deals with the economic situation of the country. It is a very interesting and informative study of the country's economic development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's economic development.

The third part of the report deals with the social situation of the country. It is a very interesting and informative study of the country's social development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's social development.

TABLE 3

Seasonal Labor Needs -- Kings County -- by Months and Tasks

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
January	Cotton: Picking	2,764,500 pounds †	200 pounds	13,823	22	629
	Apricots: Pruning	542 acres ‡	0.25 acre	2,168	22	99
	Brush burning	271 acres ‡	2.0 acres	136	22	7
	Grapes -- Thompson: Pruning	689 acres ‡	0.5 acre	1,378	22	63
	other varieties: Pruning	3,236 acres ‡	0.66 acre	4,904	22	223
	Thompson: Tying	459 acres ‡	1.5 acres	306	22	14
	Olives: Picking for oil	27 tons ‡	500 pounds	108	22	5
	Peaches: Pruning	543 acres ‡	0.25 acre	2,172	22	99
	Brush burning	271 acres ‡	2.0 acres	136	22	7
	Plums: Pruning	31 acres ‡	0.4 acre	78	22	4
February	Prunes: Pruning	103 acres ‡	0.5 acre	206	22	10
				25,415	22	1,156 man-months
	Cotton: Picking	921,000 pounds †	200 pounds	4,605	23	201
	Apricots: Pruning	541 acres ‡	0.25 acre	2,164	23	95
	Brush burning	271 acres ‡	2.0 acres	136	23	6
	Grapes -- Thompson: Pruning	689 acres ‡	0.5 acre	1,378	23	60
	other varieties: Pruning	3,236 acres ‡	0.66 acre	4,904	23	214
	Thompson: Tying vines	459 acres ‡	1.5 acres	306	23	14
	Olives: Picking for oil	13 tons	500 pounds	52	23	3
	Peaches: Pruning	543 acres ‡	0.25 acre	2,172	23	95
March	Brush burning	271 acres ‡	2.0 acres	136	23	6
	Plums: Pruning	31 acres	0.4 acre	78	23	4
	Prunes: Pruning	103 acres ‡	0.5 acre	206	23	9
				16,137	23	702 man-months
March	Grapes -- Thompson: Pruning	172 acres ‡	0.5 acre	344	12	29 (From 1-15)
	other varieties: Pruning	809 acres ‡	0.66 acre	1,226	12	103 (From 1-15)
	Thompson: Tying	230 acres ‡	1.5 acres	154	12	13 (From 1-15)
April				1,724	24	72 man-months
	Alfalfa: Mowing	1,508 acres ‡	8.0 acres	189	24	8
	Raking	1,508 acres ‡	16.0 acres	95	24	4
	Shocking by hand	1,508 acres ‡	5.0 acres	302	24	13

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
April (cont.)	Cotton: Chopping	2,950 acres	2.5 acres	1,180	12	99 (From 15-30)
	Apricots: Thinning by hand	650 acres †	0.2 acre	3,250	12	271 (From 1-15)
	Thinning by poles	361 acres †	0.5 acre	722	12	61 (From 1-15)
	Plums: Thinning	73 acres	0.2 acre	365	12	31 (From 15-30)
				6,103	24	255 man-months
May	Alfalfa: Mowing	4,522 acres †	8 acres	566	26	22
	Raking	4,522 acres †	16 acres	283	26	11
	Shocking by hand	4,522 acres †	5 acres	905	26	35
	Stacking	4,400 tons †	4 tons	1,100	26	43
	Baling	1,251 tons †	5 tons	251	26	10
	Cotton: Chopping	11,800 acres	2.5 acres	472	26	19
	Grain: Harvesting by "combine"	3,270 acres †	7.0 acres ♂	468	5	94 (From 25-31)
	Hauling	62,450 sacks †	300 sacks	209	5	42 (From 25-31)
	Sorghum for grain: Hoeing	167 acres	2.5 acres	67	26	3
	Apricots: Thinning by hand	650 acres †	0.2 acre	3,250	13	250 (From 1-15)
	Thinning by poles	361 acres †	0.5 acre	722	13	56 (From 1-15)
	Picking for fresh use	914 tons	1,200 pounds	1,524	9	170 (From 20-31)
	Peaches: Thinning	2,931 acres †	0.2 acre	14,655	26	564
	Plums: Thinning	73 acres	0.2 acre	365	13	29 (From 1-15)
				24,837	26	956 man-months
June	Alfalfa: Mowing	4,522 acres †	8 acres	566	26	22
	Raking	4,522 acres †	16 acres	283	26	11
	Shocking by hand	4,522 acres †	5 acres	905	26	35
	Stacking	4,400 tons †	4 tons	1,100	26	43
	Baling	1,251 tons †	5 tons	251	26	10
	Cotton: Chopping	2,950 acres	2.5 acres	1,180	13	91 (From 1-15)
	Irrigating	11,800 acres †	5.0 acres ♂	2,360	26	91
	Flax: Harvesting by "combine"	500 acres †	5.0 acres	100	26	4
	Grain: Harvesting by "combine"	13,080 acres †	7.0 acres ♂	1,869	26	72
	Hauling	249,802 sacks †	300 sacks	833	26	33
	Sorghum for grain: Hoeing	167 acres	2.5 acres	67	26	3
	Apricots: Picking for fresh use	2,741 tons	1,200 pounds	4,569	26	176
	Picking for drying (by hand)	1,728 tons	1,200 pounds	2,880	20	144 (From 7-30)
	Picking for drying (by shaking)	9,792 tons	1,800 pounds	10,880	20	544 (From 7-30)

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
June (cont.)	Apricots (cont.)					
	Cutting for drying	10,368 tons †	750 pounds	27,648	20	1,383 (From 7-30)
	Other dry-yard work	9,720 tons	⌘	10,692	20	535 (From 7-30)
	Plums: Picking	20 tons †	800 pounds	50	8	7 (From 20-30)
				66,233	26	2,548 man-months
July	Alfalfa: Mowing	4,522 acres †	8 acres	566	26	22
	Raking	4,522 acres †	16 acres	283	26	11
	Shocking by hand	4,522 acres †	5 acres	905	26	35
	Stacking	4,400 tons †	4 tons	1,100	26	43
	Baling	1,251 tons †	5 tons	251	26	10
	Cotton: Irrigating	11,800 acres †	5.0 acres ♂	2,360	26	91
	Flax: Harvesting by "combine"	500 acres †	5.0 acres	100	26	4
	Grain: Harvesting by "combine"	13,080 acres †	7.0 acres ♂	1,869	26	72
	Hauling	249,802 sacks †	300 sacks	833	26	33
	Sorghum for grain: Hoeing	166 acres	2.5 acres	67	26	3
	Apricots: Picking for drying (by hand)	312 tons	1,200 pounds	520	3	174 (From 1-4)
	Picking for drying (by shaking)	1,768 tons	1,800 pounds	1,965	4	492 (From 1-4)
	Cutting for drying	2,592 tons †	750 pounds	6,912	4	1,728 (From 1-4)
	Other dry-yard labor	3,240 tons †	⌘	3,564	9	396 (From 1-10)
	Peaches: Picking for shipping and canning	262 tons †	1.0 ton	262	13	21 (From 1-15)
	Picking for drying	1,485 tons †	2,500 pounds	1,188	13	92 (From 1-15)
	Cutting for drying	1,485 tons †	1.0 ton	1,485	13	115 (From 15-31)
	Plums: Picking	375 tons †	800 pounds	938	18	53 (From 1-20)
				25,168	26	968 man months
August	Alfalfa: Mowing	3,350 acres †	8 acres	419	26	17
	Raking	3,350 acres †	16 acres	210	26	9
	Shocking by hand	3,350 acres †	5 acres	670	26	26
	Stacking	2,860 tons †	4 tons	715	26	28
	Baling	813 tons †	5 tons	163	26	7
	Cotton: Irrigating	11,800 acres †	5.0 acres ♂	2,360	26	91
	Flax: Harvesting by "combine"	250 acres †	5.0 acres	50	13	4 (From 1-15)
	Grain: Harvesting by "combine"	3,270 acres †	7.0 acres ♂	468	13	36 (From 1-15)
	Hauling	62,450 sacks	300 sacks	209	13	17 (From 1-15)

Table continued on next page.

<p>1. Name of the person or organization</p> <p>2. Address</p> <p>3. City</p> <p>4. State</p> <p>5. Zip</p>	<p>6. Date of birth</p> <p>7. Sex</p> <p>8. Race</p> <p>9. Religion</p> <p>10. Education</p> <p>11. Occupation</p> <p>12. Marital status</p> <p>13. Number of children</p> <p>14. Date of marriage</p> <p>15. Date of divorce</p> <p>16. Date of death</p>	<p>17. Social Security Number</p> <p>18. Driver's License Number</p> <p>19. Vehicle Identification Number</p> <p>20. Insurance Policy Number</p> <p>21. Credit Card Number</p> <p>22. Bank Account Number</p> <p>23. Telephone Number</p> <p>24. Fax Number</p> <p>25. E-mail Address</p>	<p>26. Date of application</p> <p>27. Date of interview</p> <p>28. Date of decision</p> <p>29. Date of appeal</p> <p>30. Date of final decision</p>	<p>31. Date of payment</p> <p>32. Date of receipt</p> <p>33. Date of completion</p> <p>34. Date of closure</p> <p>35. Date of termination</p>	<p>36. Date of filing</p> <p>37. Date of review</p> <p>38. Date of appeal</p> <p>39. Date of final decision</p> <p>40. Date of closure</p>
<p>41. Name of the person or organization</p> <p>42. Address</p> <p>43. City</p> <p>44. State</p> <p>45. Zip</p>	<p>46. Date of birth</p> <p>47. Sex</p> <p>48. Race</p> <p>49. Religion</p> <p>50. Education</p> <p>51. Occupation</p> <p>52. Marital status</p> <p>53. Number of children</p> <p>54. Date of marriage</p> <p>55. Date of divorce</p> <p>56. Date of death</p>	<p>57. Social Security Number</p> <p>58. Driver's License Number</p> <p>59. Vehicle Identification Number</p> <p>60. Insurance Policy Number</p> <p>61. Credit Card Number</p> <p>62. Bank Account Number</p> <p>63. Telephone Number</p> <p>64. Fax Number</p> <p>65. E-mail Address</p>	<p>66. Date of application</p> <p>67. Date of interview</p> <p>68. Date of decision</p> <p>69. Date of appeal</p> <p>70. Date of final decision</p>	<p>71. Date of payment</p> <p>72. Date of receipt</p> <p>73. Date of completion</p> <p>74. Date of closure</p> <p>75. Date of termination</p>	<p>76. Date of filing</p> <p>77. Date of review</p> <p>78. Date of appeal</p> <p>79. Date of final decision</p> <p>80. Date of closure</p>
<p>81. Name of the person or organization</p> <p>82. Address</p> <p>83. City</p> <p>84. State</p> <p>85. Zip</p>	<p>86. Date of birth</p> <p>87. Sex</p> <p>88. Race</p> <p>89. Religion</p> <p>90. Education</p> <p>91. Occupation</p> <p>92. Marital status</p> <p>93. Number of children</p> <p>94. Date of marriage</p> <p>95. Date of divorce</p> <p>96. Date of death</p>	<p>97. Social Security Number</p> <p>98. Driver's License Number</p> <p>99. Vehicle Identification Number</p> <p>100. Insurance Policy Number</p> <p>101. Credit Card Number</p> <p>102. Bank Account Number</p> <p>103. Telephone Number</p> <p>104. Fax Number</p> <p>105. E-mail Address</p>	<p>106. Date of application</p> <p>107. Date of interview</p> <p>108. Date of decision</p> <p>109. Date of appeal</p> <p>110. Date of final decision</p>	<p>111. Date of payment</p> <p>112. Date of receipt</p> <p>113. Date of completion</p> <p>114. Date of closure</p> <p>115. Date of termination</p>	<p>116. Date of filing</p> <p>117. Date of review</p> <p>118. Date of appeal</p> <p>119. Date of final decision</p> <p>120. Date of closure</p>

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
August (cont.)	Grapes -- Thompsons: Picking for raisins	16,000 tons	3,000 pounds	10,667	26	411
	Peaches: Picking for shipping and canning	2,357 tons †	1.0 ton	2,357	26	91
	Picking for drying	13,365 tons †	2,500 pounds	10,692	26	412
	Cutting for drying	13,365 tons †	1.0 ton	13,365	26	515
	Other dry-yard labor	13,365 tons †	†	15,363	26	591
				57,708	26	2,220 man-months
September	Alfalfa: Mowing	3,350 acres †	8 acres	419	26	17
	Raking	3,350 acres †	16 acres	210	26	9
	Shocking by hand	3,350 acres †	5 acres	670	26	26
	Stacking	2,860 tons †	4 tons	715	26	28
	Baling	813 tons †	5 tons	163	26	7
	Cotton: Picking	553,000 pounds †	250 pounds	2,212	13	171 (From 15-30)
	Sorghum for grain: Cutting by hand	54 acres	0.75 acre	72	8	9 (From 20-30)
	Grapes: Picking for shipping (field packing)	1,500 tons	30 boxes †	3,572	26	138
	Picking for wineries	7,500 tons	1.5 tons	5,000	13	385 (From 15-30)
	Raisins: Turning trays	10,800 tons †	1,500 trays**	655	22	30 (From 5-30)
	Rolling paper trays	2,000 tons †	1,500 trays**	122	13	10 (From 15-30)
	Stacking wooden trays	2,000 tons †	1,000 trays**	182	13	14 (From 15-30)
	Boxing and hauling in	667 tons †	2.5 tons	267	13	21 (From 15-30)
	Olives: Picking for pickling	74 tons	400 pounds	370	13	29 (From 15-30)
	Peaches: Dry-yard labor	1,485 tons †	†	1,707	8	214 (From 1-10)
	Prunes: Picking up	2,048 tons †	1,500 pounds	2,731	26	106
	Dipping and drying	1,280 tons †	†	1,063	26	41
				20,130	26	775 man-months
October	Alfalfa: Mowing	3,350 acres †	8 acres	419	25	17
	Raking	3,350 acres †	16 acres	210	25	9
	Shocking by hand	3,350 acres †	5 acres	670	25	27
	Stacking	2,860 tons †	4 tons	715	25	29
	Baling	813 tons †	5 tons	163	25	7
	Cotton: Picking	12,717,000 pounds †	250 pounds	50,868	25	2,035

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
October (cont.)	Sorghum for grain: Cutting by hand	269 acres	0.75 acre	359	25	15
	Threshing by stationary machine	2,690 sacks †	80 sacks	34	25	2
	Harvesting by "combine"	2,369 acres †	5 acres	474	25	19
	Grapes: Picking for shipping (field packing)	9,500 tons	30 boxes #	22,620	25	905
	Picking for winery	37,500 tons	1.5 tons	25,000	25	1,000
	Raisins: Turning trays	3,600 tons †	1,500 trays**	219	8	28 (From 1-10)
	Rolling paper trays	4,000 tons †	1,500 trays**	243	25	10
	Stacking wood trays	4,000 tons †	1,000 trays**	364	25	15
	Boxing and hauling in	1,333 tons †	2.5 tons	534	25	22
	Olives: Picking for pickling	294 tons	400 pounds	1,470	25	59
	Prunes: Dipping and drying	426 tons †	†	354	12	30 (From 1-15)
	Walnuts: Shaking off, picking up, hulling by hand	103,100 pounds †	200 pounds	516	25	21
				105,232	25	4,210 man-months
November	Cotton: Picking	8,017,650 pounds †	250 pounds	32,071	24	1,337
	Sorghum for grain: Cutting by hand	215 acres	0.75 acre	287	24	12
	Threshing by stationary machine	2,690 sacks †	80 sacks	34	24	2
	Harvesting by "combine"	2,369 acres †	5 acres	474	24	20
	Apricots: Pruning	181 acres †	0.25 acre	724	24	31
	Brush burning	90 acres †	2.0 acres	45	24	2
	Grapes: Picking for shipping (field packing)	1,500 tons	30 boxes #	3,572	24	149
	Picking for winery	5,000 tons	1.5 tons	3,334	12	278 (From 1-15)
	Olives: Picking for pickling	122 tons	400 pounds	610	17	36 (From 1-21)
	Plums: Pruning	11 acres †	0.4 acre	28	24	2
	Prunes: Pruning	34 acres †	0.5 acre	68	12	6 (From 15-30)
				41,247	24	1,719 man-months
December	Cotton: Picking	3,379,500 pounds †	200 pounds	16,898	23	735
	Apricots: Pruning	542 acres †	0.25 acre	2,168	23	95
	Brush burning	271 acres †	2.0 acres	136	23	6
	Grapes -- Thompsons: Pruning	172 acres †	0.5 acre	344	23	15
	Other varieties: Pruning	809 acres †	0.66 acre	1,226	23	54
	Olives: Picking for oil	13 tons	500 pounds	52	23	3

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
December (cont.)	Peaches: Pruning	543 acres †	0.25 acre	2,172	23	95
	Brush burning	272 acres †	2.0 acres	136	23	6
	Plums: Pruning	31 acres †	0.4 acre	78	23	4
	Prunes: Pruning	103 acres	0.5 acre	206	23	9
				23,416	23	1,019 man-months

* On monthly basis unless otherwise noted.

† Seed cotton -- For September, October, and November, it is estimated that it takes 1,350 pounds of seed cotton to make a bale; after the frost -- that is, during December, January, and February -- this figure is estimated to be 1,500 pounds.

‡ Estimated portion of job done by seasonal workers.

§ Rate of work for a 12-hour day.

¶ Dry-yard labor, other than cutting, estimated to be as follows:

Apricots - 11 man-hours per fresh ton
 Peaches - 11.5 man-hours per fresh ton
 Prunes - 8.3 man-hours per fresh ton

|| Boxes of 28 pounds net of grapes.

** Trays of 22 pounds net, fresh weight; 5 pounds net, dry weight.



1. The first part of the report is a general
description of the project and its objectives.
2. The second part is a detailed description of the
methodology used in the study.
3. The third part is a description of the results
of the study.
4. The fourth part is a discussion of the results
and their implications.
5. The fifth part is a conclusion and a list of
references.

Table 1: Summary of results		Table 2: Detailed results	
Parameter	Value	Parameter	Value
Mean	1.2	Mean	1.2
Standard deviation	0.5	Standard deviation	0.5
Minimum	0.8	Minimum	0.8
Maximum	1.8	Maximum	1.8

TABLE 4

Summary of Seasonal Labor Needs by Months
Kings County
1935

Month	Required man-days of seasonal labor	Available days	Required man-months of seasonal labor
January	25,415	22	1,156
February	16,137	23	702
March	1,724	24	72
April	6,103	24	255
May	24,837	26	956
June	66,233	26	2,548
July	25,168	26	968
August	57,708	26	2,220
September	20,130	26	775
October	105,232	25	4,210
November	41,247	24	1,719
December	23,416	23	1,019
Total	413,350	--	16,600

Notes

Notes on Table 2.-- Data concerning "time of need" as shown in this table break down required seasonal labor into the period in which the work is performed in order to permit a subsequent determination of labor needs by months (table 3). Some operations are performed only to a limited extent with seasonal labor. For instance, only about 50 per cent of the labor in harvesting grain is done by seasonal workers. When a job extends over several different months, the proportionate amount for each month is shown.

The amount of work done each month is based on the cropping system followed during 1935. The allotting of amounts of work is based on findings concerning local farm practices, and required time to "make" a crop resulting from inquiry of producers, and records of carlot shipments, the latter proving helpful in fixing dates of planting and of subsequent tasks involved in producing certain crops. Proportionate amounts of output harvested each month were determined from data of local practices with respect to harvesting, and from carlot shipments of perishable products. Records of truck shipments were also used when available.

Notes on Table 3.-- Table 3 is the condensed summary of labor needs as worked out for Kings County as a result of findings pertinent to 1935. The data are presented by months with the tasks which were performed in each month indicated by both crop and task. The size of the job was calculated from the data appearing in table 1 (acreage and production) and table 2 (task, time of performance, and percentage of work pertinent to a given month). The output per man-day was calculated as indicated in the foreword presenting table 3. The number of required man-days is a result of dividing the size of task by output per man-day. The available days for the different tasks involve two variables. The first is the number of days when field work is possible because of favorable weather conditions.

The basis for this column was determined from a study of the monthly weather charts of the United States Weather Bureau for the years 1933, 1934, and 1935. These data indicated available days per month as follows (based on a 26-day working

month without allowance for holidays):

Month	Available days	Length of work day hours	Month	Available days	Length of work day hours
January	22	9	July	26	10
February	23	9	August	26	10
March	24	10	September	26	10
April	24	10	October	25	10
May	26	10	November	24	9
June	26	10	December	23	9

Source of data: Based on precipitation records of the Hanford station of the United States Weather Bureau for the years 1933, 1934, and 1935.

The second factor influencing the number of available days was the size of the job. If the output was only a few cars, then the number of days was limited to the time needed to get out those cars efficiently. If a field operation had to be performed in a period less than the number of available days in the month, then the specific number of days was noted. These restrictions are shown in parentheses. For example, in July, the picking of peaches was limited to the last half of the month.

The totals of table 3 show the total required man-days of needed seasonal labor, the available days for field work during the month, and the necessary number of men (as defined in the opening paragraph of table 3) required on a monthly basis to care for the tasks ordinarily performed by seasonal workers.

In an area such as Kings County, involving a variety of annual crops, the findings as set forth in this report are bound to fluctuate materially from year to year, because of the market outlook upon what and how much acreage is planted, and when it is planted; because of variable seasonal conditions affecting yields, time of performing operations, and available days; and because of harvesting operations on certain crops being speeded up to supply a good market, or retarded to avoid a poor one, resulting in marked variations in the need for harvest labor.

Month	Available days	Length of work day	Month	Available days	Length of work day
January	23	9	July	23	10
February	23	9	August	23	10
March	24	10	September	23	10
April	24	10	October	23	10
May	23	10	November	24	9
June	23	10	December	23	9

Source of data: Based on precipitation records of the Hanford station of the United States Weather Bureau for the years 1933, 1934, and 1935.

The second factor influencing the number of available days was the size of the job. If the output was only a few cars, then the number of days was limited to the time needed to get out those cars efficiently. If a field operation had to be performed in a period less than the number of available days in the month, then the specific number of days was noted. These restrictions are shown in parentheses. For example, in July, the plowing of benches was limited to the last half of the month.

The totals of table 3 show the total required man-days of needed seasonal labor, the available days for field work during the month, and the necessary number of men as defined in the opening paragraph of table 3, required on a monthly basis to care for the tasks ordinarily performed by seasonal workers.

In an area such as Kings County, involving a variety of annual crops, the findings as set forth in this report are bound to fluctuate materially from year to year because of the seasonal outlook upon what and how much acreage is planted, and when it is planted, because of variable seasonal conditions affecting yield, time of performing operations, and available days, and because of harvesting operations on certain crops being expedited or delayed to supply a good market, or retarded to avoid a loss, resulting in marked variations in the need for harvest labor.

